MCQ1V3216
Multilayer high Q chip inductor

Product features
• 1206 (3216 metric) package
• Multilayer monolithic construction yields high reliability
• Inductance range from 0.047 µH to 4.7 µH
• Moisture sensitivity level (MSL): 1

Applications
• Industrial connectivity (IoT)
• Wireless communications
• Bluetooth
• WiFi
• Antenna
• Machine-to-machine (M2M)
• Mobile phones
• Wearable devices
• Wireless LAN
• Computing/gaming consoles
• Broadband components
• RF transceiver modules

Environmental compliance and general specifications
• Operating temperature range: -40 °C to +85 °C (ambient plus self-temperature rise)
## Product specifications

<table>
<thead>
<tr>
<th>Part number4</th>
<th>Ls tolerance (%)</th>
<th>Ls (µH)</th>
<th>Q minimum</th>
<th>DCR (Ω) @ +25 °C maximum</th>
<th>Test frequency2 (MHz)</th>
<th>Test voltage2 (mV)</th>
<th>SRF (MHz) minimum</th>
<th>Rated I3 maximum (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCQ1V3216-R047-R</td>
<td>±10</td>
<td>0.047</td>
<td>30</td>
<td>0.15</td>
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<td>100</td>
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<td>50</td>
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<td>MCQ1V3216-1R8-R</td>
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<td>0.65</td>
<td>10</td>
<td>50</td>
<td>35</td>
<td>25</td>
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</tbody>
</table>

1. Ls = Inductance
2. Ls and Q test voltage and frequency
3. Rated I: Current rating for an approximate self-temperature rise of 40 °C or less.
4. Part Number Definition: MCQ1V3216-xxx-R
   MCQ1V3216 = Product code and size
   xxx= inductance value in µH, R= decimal point,
   If no R is present then last character equals number of zeros
   R suffix = RoHS compliant
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Mechanical parameters, schematic, pad layout (mm)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>L</th>
<th>W</th>
<th>T</th>
<th>a</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCQ1V3216.xxx-R</td>
<td>3.20±0.20</td>
<td>1.60±0.20</td>
<td>0.90±0.20</td>
<td>0.50±0.30</td>
<td>2.00 ref</td>
<td>1.40 ref</td>
<td>1.20 ref</td>
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</table>

Part marking: No marking
All soldering surfaces to be coplanar within 0.1 millimeters
Tolerances are ±0.1 millimeters unless stated otherwise
Pad layout dimensions are reference only
Traces or vias underneath the inductor is not recommended

Packaging information (mm)
Drawing not to scale
Supplied in tape and reel packaging, 4000 parts per 7” diameter reel

W±0.2   8.00
F±0.1   3.50
E1±0.2  1.75
E2 Min na
P0±0.2  4.00
P1±0.2  4.00
P2±0.1  2.00
D0±0.1  1.55
A0 1.9±0.2
B0 3.5±0.2
T 0.95±0.1
T1 Max na
## Qualification testing

<table>
<thead>
<tr>
<th>No.</th>
<th>Test item</th>
<th>Sample size (pcs)</th>
<th>Test condition</th>
<th>Acceptable value/range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>External visual</td>
<td>72</td>
<td>No physical damage</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Physical dimension</td>
<td>72</td>
<td>Specification</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Initial electrical test</td>
<td>72</td>
<td>Specification</td>
<td>User spec</td>
</tr>
<tr>
<td>4</td>
<td>Solderability</td>
<td>6</td>
<td>+245 °C ±5 °C, dipping 5 ±1 s</td>
<td>&gt;95% solder coverage</td>
</tr>
</tbody>
</table>
| 5   | Resistance to soldering heat | 6             | +260 ±5 °C for 10 ±1 s                                                         | 1. ΔL/L<±20%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 6   | Terminal strength (SMD)    | 6                 | Force of 10N for 10 ±1 s                                                       | No physical damage  
No electrical performance test |
| 7   | Low temperature exposure   | 6                 | -40 °C for 1000 hours                                                          | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 8   | Bending strength           | 6                 | Appendix 2 note: 2 mm, hold time 30 s (minimum)                                | No physical damage  
No electrical performance test |
| 9   | Drop                       | 6                 | Drop 10 times to a concrete floor from a height of 1 m                           | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 10  | Vibration                  | 6                 | Amplitude modulation: 1.5 mm Test time: A period of 2 hours in each of 3 mutually  
perpendicular directions Test from 10 Hz to 55 Hz to 10 Hz for 1 minute | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 11  | High temperature exposure  | 6                 | +85 °C for 1000 hours                                                          | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 12  | Biased humidity            | 6                 | 1000 hours +60 °C/90% to 95%RH unpowered                                         | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 13  | Operational life           | 12                | +85 °C at Rated current for 1000 hours                                          | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
| 14  | Temperature cycling        | 6                 | 32 cycles (-40 °C to +85 °C), dwell time 30 minutes                              | 1. ΔL/L<±10%  
2. ΔQ/Q<±30%  
3. No physical damage |
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Ls (Inductance) vs frequency

MCQ1V3216-R047-R

MCQ1V3216-R470-R

MCQ1V3216-4R7-R
Q vs frequency

**MCQ1V3216-R047-R**

- Q value vs Frequency [MHz]

**MCQ1V3216-R470-R**

- Q value vs Frequency [MHz]

**MCQ1V3216-4R7-R**

- Q value vs Frequency [MHz]
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Solder reflow profile

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